

CONFINED SPACE
STANDARD OPERATING GUIDELINES

FOR

MONROE COUNTY PUBLIC WORKS

PRODUCED BY

MONROE COUNTY SAFETY OFFICE

MARCH 1997

Confined Space Standard Operating Guidelines

1. POLICY

Monroe County is committed to provide a safe and healthful work environment for our entire staff. In pursuit of this endeavor the following program is in place to first identify any Permit-Required Confined Space (PRCS) and to eliminate or control hazards associated with PRCS operations. This program is in accordance with the Occupational Safety and Health Administration (OSHA) Permit-Required Confined Spaces Standard, Title 29, Code of Federal Regulations 1910.146

2. RESPONSIBILITY

Overall Program Responsibilities

CONFINED SPACE SUPERVISORY COORDINATORS

Bob Stone, Building Maintenance Administrator, Detention Facilities

Marty Gates, Area Superintendent, Roads and Bridges

John King, Senior Administrator Maintenance, Facilities Maintenance

I. B. Crutchlow, Construction Engineering

Responsible for:

- A. Coordination with the Safety Department to ensure Monroe County is complying with all confined space requirements.
- B. Overall implementation
- C. Maintenance of any written program
- D. Certification concerning the requirements
- E. Equipment of the Permit-Required Confined Space Standard to be used in the Lower Keys Facilities.
- F. Responsible for evaluating the workplace with the Safety Manager to determine if any permit required spaces are present.
- G. Responsible for determining the following requirements: (a) PRCS (b) non-permit required space, (c) alternative procedures can be used.

3. TRAINING

Responsible for ensuring that all affected personnel are properly trained and that refresher training is provided. Personnel who may be included are any authorized entrants, attendants, entry supervisors, on-site rescue team members and employees who may potentially enter a confined space.

4. INITIAL CONTACTING FOR RESCUE SERVICES

Will ensure that rescue and emergency services have been informed in each area of Monroe County of any permit-required confined spaces and have been given access to the spaces for drills, training, etc.

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5. EQUIPMENT

John King, monitor - will calibrate monthly
Marty Gates, tripod, wench, harness

Will ensure that all equipment needed for safe entry into any permit required space and non-permit required space is available and in proper working condition.

6. PERMIT SPACE IDENTIFICATION

The Safety Manager will accompany Bob Stone, John King or his designee, and Marty Gates to evaluate the workplace and determine whether permit required confined spaces exist on Monroe County property. The attached checklist will be used to evaluate each confined space on Monroe County property.

7. PREVENTION OF UNAUTHORIZED ENTRY

- A. If permit required spaces are identified at a worksite the CONFINED SPACE SUPERVISOR will inform exposed or potentially exposed employees of their existence and hazards. The method(s) that will be used is to post a danger sign at each permit required space reading Danger - permit required confined space - Do Not Enter.
- B. It has been determined that the permit required spaces at our worksites will be entered by Monroe County employees only.
- C. The measures used to prevent entry could include permanently closing the space, use of barriers, specialized tools under management's control (of open space(s)) and supplementing these measures with training and signs. The steps taken must be effective in preventing employee entry into the permit required space(s).
- D. When it is determined that an employee will enter a permit required space they shall set up procedures to ensure safe entry. Because of the different types of permit required spaces found in the work place, the regulations allow options for supervisors to obtain this goal. Proper evaluation by the appointed supervisor(s) will determine which procedures can be used.

8. PERMIT REQUIRED CONFINED SPACE (PRCS)

- A. If the Supervisor determines that their employees will enter a permit required space, then a written PRCS program is needed for each permit required space. A written PRCS program is different than that of an entry permit. A written program is a guidance document for supervisors and employees so they can develop and utilize the procedures required for safe entry into a permit required space. An entry permit is a checklist to ensure that all the steps for safe entrance have been taken prior to entry.
- B. Safe entry procedures will be developed for each permit required space a county employee may encounter. These procedures shall be developed by one of the CONFINED SPACE SUPERVISORS and reviewed by the Safety Manager before an entry is made. This program must specify the potential hazards of the space and the procedures needed to correct them. These step by step procedures must include acceptable entry conditions, isolation methods, methods for eliminating or controlling hazardous atmosphere (i.e., purging, cleaning, ventilation), equipment needed, testing protocol and duties of the permit required space team members.

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C. A written PRCS Program shall address the following elements for each permit required space entered:

- * The methods used to prevent unauthorized entry.
- * Identify and evaluate the specific hazards before entry
- * Establish measures for the safe control of identified hazards such as isolation, purging, inerting, ventilation, barricades, lockout/tagout, etc.
- * Providing and maintaining equipment necessary for safe entry, including testing, monitoring, ventilation, communications, personal protection, lighting, barriers, entry, egress and rescue equipment.
- * Procedure to test the permit required space and document results.
- * Procedure to maintain acceptable conditions in the permit required space.
- * Identify the duties of each employee and provide training.
- * Provide at least one attendant outside the permit required space for the duration of the entry operation.
- * Implement proper procedures for rescue.
- * Establish a written system for preparation, issuance, use and cancellation of permits.
- * Coordinate entry operations during multiple employee entries.
- * Review entire entry program annually, unless previously reviewed at conclusion of a specific entry.

9. ALTERNATIVE PROCEDURES

OSHA regulations allow permit required spaces which have, as their only hazard, an actual or potential hazardous atmosphere to use alternative procedures for entry. These alternative procedures do not require the implementation of a full PRCS program. The following is a list of permit required spaces at our workplace which currently qualify for alternative procedures.

1. Crawl Spaces in the Stock Island Detention Facility (Bob Stone shall number the spaces and determine which spaces do not need tether lines)

10. RECLASSIFYING PERMIT SPACE TO NON-PERMIT SPACE

OSHA regulations allow permit required spaces to be reclassified as non-permit required spaces by the total elimination of all hazards i.e, if there are no actual or potential atmospheric hazards and if all the other hazards within the space are eliminated without entry into the space.

11. PERSONNEL DUTIES AND TRAINING FOR FULL PERMIT-REQUIRED CONFINED SPACE ENTRY OPERATIONS

Each Team will consist of

- * authorized entrant
- * attendant
- * entry supervisor
- * rescue personnel

Each member of the team will receive initial and annual refresher courses. The training will be specific for the duties of each team member and include the procedures and practices necessary to protect them from the dangers of permit required spaces. The CONFINED SPACE SUPERVISORS shall provide a training program for each employees using the

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information contained in this document, use of any other applicable resources, and make a training program specific to the particular permit required space to be entered. This training must give team members the understanding, knowledge and skills necessary to safely perform their assigned duties.

The training program will include the duties of each team member as follows:

1. **Authorized Entrants**

- * Know hazards associated with the permit required space and their effects.
- * Proper use of equipment required for entry.
- * Maintaining continuous communication with the attendant.
- * Alert the attendant in the event of an emergency.
- * Evacuate the space if an emergency occurs.

2. **Attendant**

- * Know the hazards associated with the permit required space and their effects.
- * Maintain an accurate account of the authorized entrants.
- * Remain at their assigned station until relieved by another attendant or until the permit required space entry is complete.
- * Monitor conditions in and around the permit required space.
- * Summon rescue personnel and applicable medical services in the event of an emergency.
- * Perform non-entry rescue procedures.
- * Take appropriate measures to prevent unauthorized entrance into the permit required space.

3. **Entry Supervisor**

- * Know the hazards associated with the permit required space and their effects.
- * Verify that safeguards required by the permit have been implemented.
- * Verify that rescue services are available and that means for summoning them operable.
- * Cancel the written permit and terminate the permit required space entry when applicable.
- * Periodically determine that the entry operation is being performed in a manner consistent with the permit required confined space program and that acceptable entry conditions are maintained.

12. **PERMIT REQUIRED CONFINED SPACE (PRCS) PROGRAM TRAINING**

If a full permit-required confined space program is required, training is needed on the following:

- * Types of confined space hazards
- * Components of the written PRCS program.
- * Components of the entry permit system.
- * Components of the hot work permit.
- * The need for prompt guarding of the entrance opening.
- * Atmospheric testing equipment including its use, condition, and maintenance
- * Atmospheric testing protocol:
 - * oxygen, combustibles, toxics
 - * pre-entry, frequent or continuous testing
 - * check all levels of the space
- * Methods for control or elimination of any atmospheric hazards:

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- * Inerting
- * Draining and rinsing
- * Purging and cleaning
- * Continuous forced air ventilation
- * Procedures employees must follow if they detect a hazard.
- * The evaluation process to be used for re-entry if hazards are detected.
- * Train employees on the use of entry equipment (i.e., ladders, communication devices, etc.)
- * Personal protective equipment required:
 - * full body harness
 - * respiratory protection
 - * chemical protective clothing
 - * eye and face protection
- * Personnel and their responsibilities
 - * authorized entrant
 - * attendant
 - * entry supervisor
 - * rescue team
- * On-site or off-site rescue:
 - * rescue plan
 - * rescue drills
 - * basic first-aid and cardiopulmonary resuscitation certification
 - * full body harness with retrieval line attached to mechanical retrieval device
- * Procedures for annual review of canceled permits.
- * Any other information necessary to ensure employee safety during a permit required space entry operation.
- * Documentation of the training.

13. MONROE COUNTY'S CONFINED SPACE SUPERVISOR'S RESPONSIBILITIES TO CONTRACTORS

When contractors are involved in permit required space entry work at our workplace the CONFINED SPACE SUPERVISOR'S will inform them of the following information and coordinate any entry operation.

- * The location of the permit required space at the facility or location and entrance into these spaces is only attainable through a permit required confined space program or alternative procedures of space reclassification.
- * The rationale for listing the spaces as a permit required space include any identifiable hazards and/or experiences with that particular space.
- * Precautions that have been implemented to protect employees working in or near the confined space.
- * The CONFINED SPACE SUPERVISOR will advise the contractor of any hazards they may confront.

14. RESCUE AND EMERGENCY PROCEDURES

The precautions and procedures outlined in the written PRCS program are designed to ensure that all employees are safe while working in permit required spaces. Under no circumstances do we expect employees to enter a permit required space where hazards have not been eliminated or effectively controlled.

Each permit required space must be evaluated to determine whether entry or non-entry

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rescue procedures can be used to remove incapacitated entrants. Non-entry rescue is the desired method in that it is not necessary to place the rescuer at risk. Non-entry retrieval systems such as, full body harness with retrieval line, must be used unless it would heighten the risk of entry or would not contribute to the injury of the rescue.

Additionally, we recognize that unforeseen circumstances may arise to prevent self-rescue. In response, the following rescue and emergency action plan has been developed and will be strictly enforced.

1. non-entry rescue procedures, and
2. entry rescue procedures
3. Advanced notice to off site rescue personnel prior to space entry operations

The CONFINED SPACE SUPERVISOR will ensure that each member of the rescue personnel is appropriately trained: they will receive basic first aid and CPR with practice rescue techniques annually from the actual or similarly configured space. They will coordinate with the area fire departments for off-site rescue and emergency services and they have consented to provide this service. If off site rescue and/or emergency medical services are needed the following will go into effect:

1. Notify the Public Works Base Station by radio and inform them of the emergency. (No one will enter a PRCS without testing the radio and informing the Base Station that they are beginning a PRCS procedure).
2. They will notify either the fire department or emergency medical services or both.
3. A debriefing of the hazard, incident and operations will be written and attached to all applicable county forms.

15. TRAINING

Training must be given to each employee with access or potential access to a permit required space. The amount and type of training needed will depend on the individual's duty.

Four basic types of training have been set up to train employees based on duties and potential exposure.

1. **Awareness Training**-Awareness training for employees potentially exposed to permit required spaces can be satisfied by providing them with the specific location of the spaces.
2. **Training Required for Using Alternative Procedures**- if the space qualifies for alternative procedures, training on the following topics is warranted:
 - * A major point concerning the use of alternative procedures is that these procedures can only be used when a hazardous atmosphere is the only hazard of concern.
 - * The harm associated with atmospheric hazards including acceptable entry levels and symptoms of overexposure.
 - * Awareness training to recognize other potential hazards in or around the space.
 - * Any conditions which may make it unsafe to remove the entrance cover.
 - * The need for prompt guarding of the entrance opening.
 - * Atmospheric testing protocol for oxygen, combustibles and toxics.
 - * Pre-entry, frequent or continuous testing of the permit required space.

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- * Check all levels of the space for atmospheric hazards.
- * Atmospheric Controls
 - * inerting
 - * draining and rinsing
 - * purging
 - * continuous forced air ventilation including type, paper use and placement, and its limitations
- * Procedures the employee must follow if a hazardous atmosphere is detected.
- * The evaluation process to be used for reentry if a hazardous atmosphere is detected or the individual vacates the space and returns some time later.
- * Train employees on the use of entry equipment used including ladders and intrinsically safe lighting.
- * Personal protective equipment i.e., gloves, hard hats, boots, etc. its use, limitations, and required maintenance.
- * A review of the completed written certification with the employee prior to entering the space.
- * Any process which may introduce a hazard i.e., welding, cleaning with chemical solvents, etc. which would prohibit use of alternative procedures.
- * The requirements of paragraph (c)(5) must be reviewed with the employee
- * The documentation of the training.

3. Training Required for Entering Unpermitted Space or Using Reclassifying Permit Required Space Procedures- if the permit required space can be reclassified as a non-permit space the following items must be discussed:

- A. Documentation of the elimination of the hazards. If the elimination of the hazards or verification of elimination requires employees to enter the space, then a full PRCS program is needed.
- B. Train employees on the hazards associated with the space and the methods needed to eliminate the hazards such as:
 - * Isolation techniques
 - * Lockout/Tagout
 - * Disconnection and misalignment of pipes
 - * Double block and bleed
 - * Blanking and blinding
 - * Removal of engulfment hazard
 - * Elimination of hazardous atmosphere by draining, inerting, purging, cleaning and venting
 - * Train employees on the use of entry equipment used including ladders, ground fault circuit interrupters for electrical equipment, etc.
 - * Personal protective equipment i.e., gloves, hard hat, boots, etc. including its use, limitations, and required maintenance.
 - * A review of the completed written certification form.
- C. Inform employees that procedures such as welding or cleaning with chemicals, would void the reclassification and convert the space back to a permit required space.
- D. Any condition that would make it unsafe to remove cover
- E. The need for prompt guarding of the entrance opening.

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- F. Atmospheric testing equipment including its use, method of calibration and maintenance.
 - G. Atmospheric testing protocol
 - * oxygen, combustibles, toxics
 - * pre-entry, frequent or continuous testing
 - * check all levels of the space
 - H. Procedures the employee will follow if a hazard is detected.
 - I. The evaluation process to be used for re-entry if a hazard is detected after individual vacates the space and returns some time later.
 - J. Awareness training to recognize other potential hazards in or around the space.
 - K. Documentation of the training.
 - 4. **Training Required for Using full Permit-Required Confined Space Procedures** - See section 11 and 12.
16. LOCATIONS AND HAZARD POSED BY THESE PERMIT SPACES
- A. MANHOLES THROUGHOUT THE COUNTY
 - 1. The Roads and Bridges crew may be required to enter the drains and manholes that Monroe County is responsible for maintaining near Higgs Beach, Flagler Avenue and the Public Service Building.
 - 2. The Engineering Department may be required to enter a manhole. They must comply with all monitoring regulations and have confined space training.
 - 3. The Marathon Government Building has a manhole approximately six feet deep that maintenance personnel need to enter to clean the sewage system.
 - B. DETENTION FACILITY CRAWL SPACE

There are many crawl spaces throughout this facility that fit the criteria for confined spaces.
 - C. WATER STORAGE TANKS

Monroe County is required to have water storage tanks for buildings that require a sprinkler system. These tanks are required to have an access panel for maintenance.
 - D. HOUSEHOLD HAZARDOUS WASTE STORAGE FACILITIES

The storage facilities that hold household hazardous waste at Cudjoe Key and Long Key landfills have the potential of a hazardous atmospheric condition. All personnel that work in this area are required to comply with all applicable confined space procedures.
 - E. FACILITIES MAINTENANCE AT THE KEY WEST COURTHOUSE and ANNEX

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- a. From time to time, county personnel must work in the crawl space throughout and under this building.
- b. Plumbing operations in Key West and throughout the Keys area may include entering confined spaces.
- c. East Martello Towers and the Lighthouse Museum.

17. REVIEW AND REVISION

Within one year of an entry operation the CONFINED SPACE SUPERVISORY COORDINATORS will conduct a review of the program using cancelled entry permits to identify any deficiencies. A review will be conducted earlier if there is reason to believe that the program does not adequately protect our employees. Any corrective measures will be documented and be a revision of the program. Employees will be trained on any changes. Additionally, employees who note any inadequacies with the program can contact the CONFINED SPACE SUPERVISORY COORDINATOR or the Safety Manager.

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18. CONFINED SPACE AUTHORIZED PERSONNEL LIST (all training will also be documented
on Employee Safety Health Record

Supervisor	Trainer	Training Date
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Authorized Entrants	Trainer	Training Date
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Authorized Attendant	Trainer	Training Date
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19. CERTIFICATION FORM

RECOMMENDATIONS FOR SAFE ENTRY: use the following checklist to evaluate the confined space.

DO NOT ENTER A CONFINED SPACE UNTIL YOU HAVE CONSIDERED EVERY QUESTION, AND HAVE DETERMINED THE SPACE TO BE SAFE.

YES NO

___ ___ Is entry necessary?

TESTING

___ ___ Are the instruments used in atmospheric testing properly calibrated?

___ ___ Was the atmosphere in the confined space tested?

___ ___ Was the Oxygen at least 19.5% - not more than 21%

___ ___ Were toxic, flammable, or oxygen-displacing gasses/vapors present?

-Hydrogen sulfide

-Carbon Monoxide

-Flammable Gasses

-Other (list) _____

MONITORING

___ ___ Will the atmosphere in the space be monitored while work is going on?

___ ___ Continuously?

___ ___ Periodically? (If yes, give interval: _____)

REMEMBER - atmospheric changes occur due to the work procedure or the product stored. The atmosphere may be safe when you enter, but can change very quickly.

CLEANING

___ ___ Has the space been cleaned before entry is made?

___ ___ Was the space steamed?

___ ___ If so, was it allowed to cool.

VENTILATION

___ ___ Has the space been ventilated before entry?

___ ___ Will ventilation be continued during entry?

___ ___ Is the air intake for the ventilation system free of combustible dust, vapors and toxic substances?

___ ___ If atmosphere was found unacceptable and then ventilated, was it re-tested before entry?

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ISOLATION

- ☐ ☐ Has the space been isolated from other systems?
- ☐ ☐ Has electrical equipment been locked out?
- ☐ ☐ Have disconnects been used where possible?
- ☐ ☐ Has mechanical equipment been blocked, chocked and disengaged where necessary?
- ☐ ☐ Have lines under pressure been blanked and bled?

CLOTHING/EQUIPMENT

- ☐ ☐ Is special clothing required (boots, chemical suits, glasses, etc.)? (If so specify: _____)
- ☐ ☐ Is special equipment required (i.e., rescue equipment, communications equipment, etc.)? (If so specify: _____)
- (_____)
- ☐ ☐ Are special tools required (e.g., sparkproof)

TRAINING

- ☐ ☐ Have you been trained on the proper use of a respirator?
- ☐ ☐ Have you received first aid/CPR training?
- ☐ ☐ Have you been trained in confined space entry and do you know what to look for?

RESPIRATORY PROTECTION

- ☐ ☐ Are MSHA/NIOSH approved respirators required and available at the worksite?
- ☐ ☐ Is respiratory protection required (e.g., air-purifying, supplied air, self-contained breathing apparatus, etc.)
If so, specify: _____)

STANDBY/RESCUE

- ☐ ☐ Are you familiar with emergency rescue procedures?
- ☐ ☐ Do you know who to notify and how in the event of an emergency?
- ☐ ☐ Are county rescue procedures available to be followed in the event of an emergency?
- ☐ ☐ Will there be a standby person on the outside in constant visual or auditory communication with the person on the inside?
- ☐ ☐ Will safety lines and harness be required to remove a person?
- ☐ ☐ Has the standby person(s) been trained in rescue procedures?

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20. PERMIT

This permit is an authorization which states that the space has been tested by a qualified person, is safe for entry what precautions, equipment, are required, and what work is to be done.)

___ ___ Has a confined space entry permit been issued?

___ ___ Does the permit include a list of emergency telephone numbers?

Supervisor's Signature

Date

Print Supervisors Name

list employees involved in the entry procedure.

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21. LIST OF EMPLOYEES TRAINED IN ALL LEVELS OF PRCS ENTRY.
(ATTACHED LIST)